UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/551,359	10/03/2008	Yi Xiong	329092000600	6555

25225 7590 03/18/2011

MORRISON & FOERSTER LLP
12531 HIGH BLUFF DRIVE
SUITE 100
SAN DIEGO, CA 92130-2040

EXAMINER	
FINDLEY, CHRISTOPHER G	
ART UNIT	PAPER NUMBER
2482	

NOTIFICATION DATE	DELIVERY MODE
03/18/2011	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

EOfficeSD@mofo.com
PatentDocket@mofo.com
Drcaldwell@mofo.com

Office Action Summary	Application No.	Applicant(s)	
	10/551,359	XIONG ET AL.	
	Examiner	Art Unit	
	CHRISTOPHER FINDLEY	2482	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 December 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 and 3-11* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 and 3-11* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 12/30/2010 have been fully considered but they are not persuasive.

2. Re claim 1, the Applicant contends that the prior art cited fails to teach or suggest decomposing said residual image into a list of one or more atoms, each atom representing a basis function from the overcomplete library, decomposing comprising identifying a replacement region in the residual image for representation by an atom using residual energy segmentation; and identifying an atom within the subset of basis functions using progressive elimination, said atom for representing the replacement region and said atom having parameters because Zakhor uses a matching pursuits algorithm instead of progressive elimination. However, the Examiner respectfully disagrees. The procedure of Zakhor uses a finite subset dictionary taken from a much larger dictionary (Zakhor: column 9, lines 23-29), wherein the dictionary subset is determined by using an elimination process (Zakhor: column 9, lines 29-37).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zakhor et al. (US 5699121 A, hereinafter referred to as "Zakhor") in view of Vleeschouwer (US 20020114393 A1).

Re **claim 1**, Zakhor discloses a method for encoding a residual image using basis functions from an overcomplete library, said method comprising: obtaining the residual image, said residual image having a size and an energy (Zakhor: column 4, lines 31-41, the motion prediction signal is subtracted from the video signal to produce a motion residual signal); and decomposing said residual image into a list of one or more atoms, each atom representing a basis function from the overcomplete library (Zakhor:

column 5, lines 9-28, motion residual input patterns are compared to patterns in a library to find the closest match and determine a weighting factor, wherein the specific pattern, the weighting coefficient, and the exact position within the image describe an atom), decomposing said residual image comprising: identifying a replacement region in the residual image for representation by an atom using a residual energy segmentation (Zakhor: column 5, lines 29-39, dividing motion residual signal into seek blocks); creating a subset of basis functions from the overcomplete library, each basis function in the subset matching with the replacement region within a predetermined threshold (Zakhor: column 9, lines 26-37); identifying an atom within the subset of basis functions using progressive elimination, said atom for representing the replacement region and said atom having parameters (Zakhor: column 9, lines 16-22, matching pursuit used to match pattern library of basis structures to energy patterns in motion residual); quantizing said atom and modifying the parameters of the atom into a form suited for encoding (Zakhor: column 6, lines 25-26, atom coder performs quantization); encoding said quantized atom (Zakhor: column 6, lines 25-26, atom coder performs variable length coding VLC), subtracting said atom from the replacement region in the residual image to reduce the energy of the residual image (Zakhor: column 10, lines 36-60); and when a reduced size of the residual image or a reduced energy of the residual image does not achieve a predetermined criteria; further identifying a replacement region, creating the subset of basis functions, identifying an atom within the subset of basis functions, quantizing said atom, and encoding said quantized atom (Zakhor: column 10, lines 36-60, the next stage residual is generated from the subtraction operation; column 8, lines 21-31, the procedure is repeated iteratively until an energy threshold is reached).

Zakhor does not specifically disclose using a quadtree-based atom coder to reduce the size of the residual image. However, Vleeschouwer discloses a method and apparatus for adaptively encoding framed data sequences, wherein the procedure includes the use of first and second sub-encoding steps (Vleeschouwer: paragraph [0075]), and the sub-encoding methods can be based on matching pursuits and tree coding such as quadtree (Vleeschouwer: paragraph [0088]). Since Zakhor and Vleeschouwer both relate to performing adaptive block-by-block coding schemes, one of ordinary skill in the art at the

time of the inventionwould have found it obvious to include the first and second sub-encoding steps of Vleeschouwer with the atom based coding of Zakhor in order to take advantage of multiple coding optimization schemes so that bandwidth and buffer constraints may be met while maintaining the highest visual quality possible.

Re **claim 2**, Zakhor discloses that the step of identifying an atom within the subset of basis functions is performed using a progressive elimination algorithm (Zakhor: column 8, lines 21-29, matched patterns are eliminated so that remaining high energy patterns can be processed).

Re **claim 3**, Zakhor discloses that the step of identifying a replacement region comprises the generation of a RESA rectangle (Zakhor: column 5, lines 29-40).

Re **claim 4**, Zakhor discloses that the step of identifying a replacement region comprises identification of an initial region within the residual image having a highest energy, and growing the RESA rectangle therefrom (Zakhor: column 5, lines 29-40).

Re **claim 5**, Zakhor discloses that the step of identifying an atom within the subset of basis functions comprises determining an inner product between a basis function and the replacement region, wherein a maximum absolute value of the inner product indicates a best match (Zakhor: column 7, lines 61-67).

Re **claim 6**, Zakhor discloses that the RESA rectangle is compared to the basis functions within the overcomplete library and the basis functions that are sufficiently match the RESA rectangle are placed in the subset of basis functions (Zakhor: column 5, lines 46-58).

Re **claim 7**, Zakhor discloses that the progressive elimination algorithm removes basis functions from the subset of basis functions by comparing a basis function currently being evaluated with a previously evaluated basis function (Zakhor: column 8, lines 21-29, matched patterns are eliminated so that remaining high energy patterns can be processed).

Re **claim 8**, Zakhor discloses that the step of quantizing the atom comprises determining a quantizer based on a comparison between the atom and the replacement region (Zakhor: Fig. 4, step 96, the atom is processed after the pattern matching [step 68] is performed; column 6, lines 13-37, the coded residual signal is processed by the atom coder, wherein the atom coder performs quantization).

Re **claim 9**, Zakhor discloses that the predetermined criteria is determined based on a desired bit stream size (Zakhor: Fig. 4, step 94, the decision whether or not to continue pattern matching is based on the availability of bits).

Claim 10 recites the corresponding apparatus for implementing the method of claim 1, and therefore claim 10 has been analyzed and rejected with respect to claim 1 above.

Claim 11 recites the corresponding compute readable medium for implementing the method of claim 1, and therefore claim 11 has been analyzed and rejected with respect to claim 1 above.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

   a. Dictionary generation method for video and image compression; Zakhor et al. (US 7003039 B2)

   b. Video encoding method based on the matching pursuit algorithm; Bottreau et al. (US 6625213 B2)

   c. Computer graphics; Clarke (US 7439970 B1)

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action

is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Contact

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHRISTOPHER FINDLEY whose telephone number is (571)270-1199. The examiner can normally be reached on Monday-Friday (8:30 AM-5:00 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marsha D. Banks-Harold can be reached on 571-272-7905. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Marsha D. Banks-Harold/
Supervisory Patent Examiner, Art Unit 2482

/Christopher Findley/